

LONGER LIFE PAVEMENT

FREQUENTLY ASKED QUESTIONS

1. What is Longer Life Pavement?

Answer: Longer life pavement is more of a goal and philosophy than a standard or program. It is more than building just to meet a predetermined design or service life. The goal of longer life pavement is to get the most out of every dollar spent on pavement construction. This means maximizing the life of the pavement by utilizing:

- a. Designs and details that maximize pavement life at little to no added cost.
- b. Inexpensive pavement preservation techniques to maintain existing pavement while it is yet in good condition.
- c. Strategies that promote lower life cycle costs, even if there may be higher initial costs.
- d. Establishing higher pavement performance standards while providing greater flexibility for designers and contractors to meet those standards to promote creativity. In other words, establish what you want to achieve rather than how to get there.

Where standards are established, there is a greater need to adhere to them in designing and building pavements.

2. How can we afford to spend more on initial pavements construction, when the State lacks the funds to meet all of its needs? Couldn't we spend less now and rehabilitate later when we have the money?

Answer: The simple answer is we can't afford not to. It may be convenient to cut costs now and let future projects deal with the resultant repairs, but this ends up costing the state more money in the long run. For example, by increasing a 230 mm (9-inch) PCC pavement by 25 mm (1 inch) during initial construction has historically cost us about \$15,000 per lane-km, with an increase in the pavement service life by 10 to 20 years. This compares to (in current \$) \$30,000 per lane-km to grind the pavement, and \$250,000 per lane-km to do a crack, seat, and overlay. These are costs that can be avoided in the future simply by spending an additional \$15,000 per lane-km now. Note that these future costs, will come from the same transportation resources we use today and will cut into funds that will be needed in the future for expansion, mitigation, and other transportation improvement costs.

3. Isn't longer life pavement expensive?

Answer: It doesn't have to be. Longer life pavement can also be achieved by being smarter in how we design and construct pavement structural sections. Adding 25 mm (1-inch) to PCC pavement is relatively inexpensive and can be accomplished with the same equipment and labor, but adds 50-100% to the life of the pavement. In addition, the use of specialized binders, rubberized asphalt concrete, reinforcing fabrics, and other enhancements can improve the life of performance of pavement for little to no additional cost.

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4. What is meant by the term “Get-In, Get-Out, Stay-Out”?

"Get In, Get Out, Stay Out" is the philosophy for planning, design, and construction of roadways by the State and other governmental and business interests that minimizes the impact to travelers and neighbors while maximizing the performance of the work performed.

"Get In" means that once a need has been determined, the best means are used to expedite getting the work planned, designed, and constructed. To do this involves knowing what the highway needs are (not just pavement needs), being able to prioritize those needs, and then mapping out how to meet those needs through a sequence of projects or events. It also involves communication/coordination with the locals, utilities, and other stakeholders, who may have plans or needs on the highway right of way. Corridor planning and sound project management should be utilized to develop, execute, and maintain a plan for meeting the highway needs.

"Get Out" means dramatically shortened construction time and less congestion due to work zones. This is accomplished by:

- Using preventive maintenance techniques to preserve the existing system and extend life while it is still in good condition, reducing the need for more costly, time-consuming rehabilitation.
- When rehabilitation or reconstruction is necessary, scope the work to minimize user delays over the long term. This may mean combining work with planned work from other projects (such as State, local, utility, and other interests) & including needed work that may be done under the same lane closures.
- Utilize innovative traffic handling measures to keep traffic moving during construction. Examples include 55 & 72-hour lane closures, construction of temporary detours, or complete closures. These strategies have provided Contractors the ability to complete work faster (thereby reducing overall user delay) while providing higher quality work (thus extending the time for when maintenance and rehabilitation is needed). These strategies have been shown to be most effective when combined with an aggressive public information campaign.

"Stay Out" means using quality control/quality assurance procedures, high-performance materials, and advanced design specifications to ensure the construction project will deliver many years of safe, reliable service with minimum maintenance. Another way to say this is to *build it well, build it right the first time* to avoid coming back for additional upgrades or unnecessary maintenance. It should be emphasized that there is no such thing as zero

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maintenance, but if the project is well designed and constructed, maintenance efforts and costs should be minimal. One method for determining the most cost effective method to “Stay Out” is to utilize life cycle cost analysis that includes user delay costs.

5. How can I determine life cycle costs in order to establish the optimal pavement service life?

Answer: Life cycle costs take into account current and prorated future costs in order to establish which alternative would have the lowest costs to the State over the life of the project. LCCA is covered in Index 605.3 of the Highway Design Manual. A sample methodology is included as well, but does need to be updated. The Division of Design is working on developing an updated methodology that will better take into account future engineering, maintenance, construction, and user costs. In the meantime, when doing a life cycle cost analysis, the designer should make realistic estimates of the following items:

- a. *Initial construction costs.* This includes not only pavement costs, but also associated costs such as traffic control, stage construction, utility, right of way, electrical, environmental work, and other upgrades that would be associated with the pavement work. Engineering costs (the cost to scope and develop contract plans, specifications, and estimates) should be included as well if there is cost differences between the different alternatives. Note that when doing cost comparisons using life cycle costs, it is not necessary to repeat costs that are common to all projects.
- b. *Future maintenance costs.* The engineering, material, labor, traffic control, and other associated costs for performing preventive maintenance should be included. This includes both work by State maintenance forces and contractors through the HM program. Work may involve such activities such as fog seals, sealing cracks, concrete slab replacements, dig outs, and other activities needed to keep the pavement in good condition. Note that these costs should be based on what should be done to keep the pavement in good condition and not what may be actually happening.
- c. *Future Cap-M and rehabilitation costs.* This includes all the pavement related costs to develop plans, specifications, estimates, construction contract administration, and constructing the project. Construction costs include traffic control, stage construction, utility, right of way, electrical, environmental, and other associated upgrades.

Note that in determining future Cap-M and rehabilitation projects to estimate, there is no one size fits all answer. When or how much work is required depends a lot on the materials and thickness used in the initial design. For example, undoweled concrete pavement typically needs to be ground after 15-20 years, while doweled pavement can typically last 30-40 years without grinding.

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Rubberized AC does not crack as quickly as conventional AC so crack sealing should not be as extensive or frequent. Open graded AC typically will need to be replaced every 5-7 years (10-12 years if rubberized). Pavements that are not aggressively maintained or are in harsh environments (like deserts, and high mountains) will also need work more often.

- d. *User delay costs.* These are costs associated with the delays travelers encounter from maintenance and construction activities. These costs are the hardest to quantify and are indirect costs to the state (i.e. not a direct cost to the Department's budget but does impact State productivity because of drivers lost time to work, shop, or transport good). The unit responsible for user delay cost development and updates was defined as the Division of Highways and Programming in a Memorandum dated February 26, 1990 and updated by Memorandum dated October 24, 1996. The Division of Traffic Operations is responsible for monitoring accident costs and for notifying the Division of Highways and Programming when costs have changed. To get the most current user delay costs, we recommend talking to and working with District Traffic or the unit responsible for traffic forecasting.